

WHAT IS CLAIMED IS:

1. An image sensor comprising:
 - (a) a plurality of light measuring elements arranged in an array and
5 at least a portion of the elements have a color filter mated with the light receiving elements which permits selective color reception by the light measuring elements;
 - (b) a plurality of floating diffusions respectively mated with the plurality of light receiving elements; and
 - c) an output structure electrically connected to two or more of the
10 floating diffusions; wherein the at least two light receiving elements receiving the same color are transferred to the output structure substantially simultaneously.
2. The image sensor as in claim 1, wherein all the light receiving electrically connected to the same output structure are transferred to the output
15 structure substantially simultaneously.
3. A camera comprising:
 - (a) an image sensor comprising:
 - (a1) a plurality of light measuring elements arranged in an
20 array and at least a portion of the elements have a color filter mated with the light receiving elements which permits selective color reception by the light measuring elements;
 - (a2) a plurality of floating diffusions respectively mated with the plurality of light receiving elements; and
 - (a3) an output structure electrically connected to two or
25 more of the floating diffusions; wherein the at least two light receiving elements receiving the same color are transferred to the output structure substantially simultaneously.
- 30 4. The camera as in claim 3, wherein all the light receiving electrically connected to the same output structure are transferred to the output structure substantially simultaneously.

5. An image sensor comprising:

- 5 (a) a plurality of light measuring elements a portion of which have a color filter mated with the light receiving elements, and the light receiving elements are arranged in an array;
- (b) a plurality of floating diffusions respectively mated with the plurality of light receiving elements;
- (c) two column circuits used to store the signal from the light receiving elements one row at a time; and
- 10 (d) a select switch used to control which column circuit a particular signal from a light receiving is stored.

6. The image sensor as in claim 5, wherein substantially all of the same colors are transferred to the same column circuit.

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7. The image sensor as in claim 6, wherein adjacent samples in each column circuit are averaged.

8. A camera comprising:

- 20 (a) an image sensor comprising:
- (a1) a plurality of light measuring elements a portion of which have a color filter mated with the light receiving elements, and the light receiving elements are arranged in an array;
- (a2) a plurality of floating diffusions respectively mated
- 25 with the plurality of light receiving elements;
- (a3) two column circuits used to store the signal from the light receiving elements one row at a time; and
- (a4) a select switch used to control which column circuit a particular signal from a light receiving is stored.

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9. The camera as in claim 8, wherein substantially all of the same colors are transferred to the same column circuit.

10. The camera as in claim 9, wherein adjacent samples in each column circuit are averaged.

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11. An x-y addressable image sensor comprising:

(a) a plurality of light measuring elements arranged in an array of rows and columns that convert the light to a signal;

(b) at least two signal storage banks comprised of individual signal storage elements; the at least two storage banks having enough individual storage elements to store the signals from at least one row of light measuring elements in the array; and

(c) at least two select mechanisms which can direct signals from the plurality of light measuring elements to any single or combination of the signal storage banks.

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12. The image sensor as in claim 11 further comprising a plurality of color filters mated with the plurality of light measuring elements, and the select mechanism is used to send signals from the light measuring elements mated to a single color filter type to a desired signal storage bank such that, for any given row, a single signal storage bank contains signals from a single color type.

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13. The image sensor as in claim 12 wherein the color filter is a Bayer pattern in which a color of a single type is sent to only one of the two signal storage banks.

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14. The image sensor as in claim 13, wherein the single color type sent to only one of the storage regions is green.

15. The image sensor as in claim 11, wherein the individual signal storage elements in the signal storage banks are larger than light measuring element pitch.

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16. The image sensor as in claim 11, wherein the at least two select mechanisms direct signals from the each of the plurality of light measuring elements to both signal storage banks.

5 17. The image sensor as in claim 11 further comprising a plurality of signal storage banks and the at least two select mechanisms direct signals to multiple signal storage banks.

10 18. The image sensor as in claim 11, wherein a single pixel can be directed to multiple single storage elements within any signal storage bank.

15 19. The image sensor of claim 18, wherein adjacent signals from the light measuring elements in the adjacent signal storage elements are averaged to produce a single value.

20 20. The image sensor as in claim 11, wherein a single pixel can be directed to adjacent individual signal storage elements within any signal storage bank.

25 21. The image sensor of claim 20, wherein adjacent signals from the light measuring elements in the adjacent signal storage elements are averaged to produce a single value.

30 22. An image sensor comprising:
 (a) a plurality of light measuring elements each having a photodetector and a transfer mechanism; and
 (b) a plurality of charge to voltage conversion regions; wherein at least two adjacent light measuring elements share a charge to voltage conversion region;
 wherein charge of adjacent light measuring elements is combined in the shared charge to voltage conversion region.

23. The image sensor as in claim 22, wherein the timing selectively combines charge from light measuring elements with a similar color filter array element.

5 24. The image sensor as in claim 22, wherein charge of adjacent light measuring elements is substantially simultaneously transferred to the shared charge to voltage conversion region

10 25. The image sensor as in claim 22, wherein the charge of all adjacent light measuring elements associated with a common charge to voltage conversion regions is transferred to the shared charge to voltage conversion region to form a single voltage signal associated with all of the adjacent light measuring elements.

15 26. A camera comprising:
 an x-y addressable image sensor comprising:
 (a) a plurality of light measuring elements arranged in an array of rows and columns that convert the light to a signal;
 (b) at least two signal storage banks comprised of individual signal
20 storage elements; the at least two storage banks having enough individual storage elements to store the signals from at least one row of light measuring elements in the array; and
 (c) at least two select mechanisms which can direct signals from
 the plurality of light measuring elements to any single or combination of the
25 signal storage banks.

 27. The camera as in claim 26 further comprising a plurality of color filters mated with the plurality of light measuring elements, and the select mechanism is used to send signals from the light measuring elements mated to a
30 single color filter type to a desired signal storage bank such that, for any given row, a single signal storage bank contains signals from a single color type.

28. The camera as in claim 27 wherein the color filter is a Bayer pattern in which a color of a single type is sent to only one of the two signal storage banks.

5 29. The camera as in claim 28, wherein the single color type sent to only one of the storage regions is green.

10 30. The camera as in claim 26, wherein the individual signal storage elements in the signal storage banks are larger than light measuring element pitch.

15 31. The camera as in claim 26, wherein the at least two select mechanisms direct signals from the each of the plurality of light measuring elements to both signal storage banks.

 32. The camera as in claim 26 further comprising a plurality of signal storage banks and the at least two select mechanisms direct signals to multiple signal storage banks.

20 33. The camera as in claim 26, wherein a single pixel can be directed to multiple single storage elements within any signal storage bank.

25 34. The camera as in claim 33, wherein adjacent signals from the light measuring elements in the adjacent signal storage elements are averaged to produce a single value.

30 35. The camera as in claim 26, wherein a single pixel can be directed to adjacent individual signal storage elements within any signal storage bank.

36. The camera as in claim 35, wherein adjacent signals from the light measuring elements in the adjacent signal storage elements are averaged to produce a single value.

5 37. A camera comprising:
 an image sensor comprising:
 (a) a plurality of light measuring elements each having a
photodetector and a transfer mechanism; and
 (b) a plurality of charge to voltage conversion regions; wherein at
10 least two adjacent light measuring elements share a charge to voltage conversion
region;
 wherein charge of adjacent light measuring elements is combined
in the shared charge to voltage conversion region.

15 38. The camera as in claim 37, wherein the timing selectively
combines charge from light measuring elements with a similar color filter array
element.

 39. The camera as in claim 37, wherein charge of adjacent light
20 measuring elements is substantially simultaneously transferred to the shared
charge to voltage conversion region

 40. The camera as in claim 37, wherein the charge of all adjacent
light measuring elements associated with a common charge to voltage conversion
25 regions is transferred to the shared charge to voltage conversion region to form a
single voltage signal associated with all of the adjacent light measuring elements.